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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,368	10/22/2003	Thomas Robert Raber	RD29386-1	1398

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GENERAL ELECTRIC CO.
GLOBAL PATENT OPERATION
187 Danbury Road
Suite 204
Wilton, CT 06897-4122

EXAMINER	
VIJAYAKUMAR, KALLAMBELLA M	

ART UNIT	PAPER NUMBER
1751	

DATE MAILED: 10/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/691,368	RABER ET AL.	
	Examiner	Art Unit	
	Kallambella Vijayakumar	1751	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 June 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12 and 14-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-12 and 14-16* is/are allowed.

6)☒ Claim(s) *17-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

- Claims 10, 17, 19, 21 were amended. Claims 13 and 25-30 were cancelled. Claims 1-12 and 14-24 are currently pending with the application.
- Applicant's comments on the allowance of the claim-1 are noted and placed on the record. Applicant's amendment to claim 10 overcomes its in the previous office action. Applicants arguments have been fully considered and are moot in view of new rejection that follows:

Claim Rejections - 35 USC § 102

Claim Rejections - 35 USC § 103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 17-19 and 22 rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Furuichi (US 2001/0055696).

Furuichi teaches joining of two metal wires containing a core comprising a mixture of Al and low vapor pressure metal/metalloid compounds such as magnesium boride powders present in an aluminum envelope and the cut portions of the wires connected by butt resistance welding forming a wire of desired length (Abstract, Fig-3, Para 0012, 0017, 0032, 0033-34, 0037, 0049). Butt resistive heating meets the limitation of claims 18 and 22. The cooling of a hot weld joint before use per the claim 19 will be anticipated. All the limitations of the instant claims are met.

The reference is anticipatory

In the alternative that the disclosure by Furuichi be insufficient to arrive at the limitations of the instant claims, it would be obvious to a person of ordinary skilled in the art to optimize the conditions of weld-joining of the wires as choice of design of operational conditions of the welding with reasonable expectation of success.

2. Claim 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furuichi (US 2001/ 0055696).

The disclosure on the making of the wire by Furuchi as set forth in rejection-1 under 35 USC 102(b)/103(a) is herein incorporated.

The prior art is silent about the length of the wire.

However, the prior art teaches that the wire of any desired length can be made, and it would have been obvious to a person of ordinary skilled in the art to optimize the process for making the wire of any needed length as a choice of design of the desired application with reasonable expectation of success.

3. Claims 17-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morita et al (US 2003/0051901) in view of Thieme et al (US 2002/0173428).

Morita et al teach forming a high performance superconductor connection structure comprising joining of two MgB2 superconductor lines/tapes/wires for superconducting magnet system by applying MgB2 powder and a metal powder to the connection point, and heating the connection point to a temperature equal to or higher than the melting point of one of the constituents thus forming a connection, and further forming a superconducting magnet apparatus using the structure (Abstract, Para 0002, 0015-0017, 0019, 0023- 0025, 0029; Fig, 1a, 2, 5a, 5b, 7, 8; Claims 1-2, 8). Morita et al further teach removing the stabilizer portion from the tips of the superconductor wires either by chemical or mechanical means thus exposing the superconducting filaments before joining them together (Para-0051, 0073). Morita et al further teach making superconducting connection structure using NbTi-metal matrix superconducting wires, wherein the joint portion contained MgB2-metal matrix (Para-0090).

The prior art fails to teach a joint containing a MgB2/metal matrix super conducting wire/tape and the sequence of order of heating the structure per claim-17, a method of heating the connection/joint per claim 18, heating it to a temperature between 600-1000C per claim 20, and forming a wire equal to or grater than 350,000 ft per claim 24.

In the analogous art, Thieme et al teach forming MgB2 wires containing MgB2 alloy powders and MgB2 wires containing metal matrix/cross-sections containing non-superconducting metal such as copper (Para-0034; 0054).

It would be obvious to a person of ordinary skilled in the art to combine the prior art teachings to substitute the MgB2 wires/tapes in the connection structure of Morita et al with the metal matrix containing MgB2 wires/tapes of Theme et al as functional equivalent with reasonable expectation of success, because the combined prior art teaching is suggestive of the claimed process.

With regard to the sequence of heating and joining the two superconducting MgB2 tapes, the prior art teaches heat fusing the components forming a connecting structure that is prima facie over the instant claimed sequence. See, Ex parte Rubin , 128 USPQ 440 (Bd. App. 1959) (Prior art reference disclosing a process of making a laminated sheet wherein a base sheet is first coated with a metallic film and thereafter impregnated with a thermosetting material was held to render prima facie obvious claims directed to a process of making a laminated sheet by reversing the order of the prior art process steps.). See also In re Burhans, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) (selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results).

With regard to claims 18 and 20, the prior art teaches forming the superconductor connection by heating the joint to a point of melting one of the constituents that includes metals such as Ag, Al and Mg (Para 0024) and it would have been obvious to heat to about 962 C (Ag) or 660C (Al) or 650C (Mg) which are melting points of the respective metals, by conventional methods such as electrical resistive heating well known in the art with reasonable expectation of success (See, Miyoshi JP 2003-086265; Para 0010; Malozemoff et al US 2005/0016759, Para 0005; Thieme et al, Fig-6).

With regard to claim-19, it would be obvious to cool a heated joint before use.

With regard to claims 21-23, the prior art teaches adding MgB2 or MgB2-metal matrix at the junction forming a weld by thermal means, and the instant claimed improvement would be obvious.

With regard to the length of the wire in the claim 24, the prior art teaches making superconductor connection for a magnet system, a current lead or a power transmission line with high performance (Abstract, Para 0002), and it would have been obvious to a person or ordinary skill in the art to optimize

the length of the superconductor wire/article as desired with reasonable expectation of success, because the prior art does not limit the article to any particular lengths and suggestive of its use in power transmission.

Allowable Subject Matter

Claims 1-12 and 14-16 are allowed.

The prior art of record neither teaches nor fairly suggest a method of manufacturing MgB2 wires by the instant claimed method steps.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 571-272-1324. The examiner can normally be reached on 8.30-6.00 Mon-Thu, 8.30-5.00 Alt Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas McGinty can be reached on 571-272-1029. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KMV
October 13, 2006.

DOUGLAS MCGINTY
SUPERVISORY PATENT EXAMINER
1751